BACKGROUND FOR EDITORS

DIGITAL'S NETWORK APPLICATION SUPPORT: DELIVERING THE UNIFIED SOFTWARE ENVIRONMENT FOR THE '90S

As the '90s approach, organizations are facing increasingly competitive challenges. As a result, they are demanding more from their system suppliers. Organizations need systems that offer more than just wire connections and file sharing -- they need software applications that work together, throughout a global network of hardware and operating systems from many different vendors.

In addition, organizations want to take advantage of the benefits offered by an open computing environment based on industry standards -- so that they can incorporate new technologies into their computing environment, without discarding their investments and without disrupting their users.

The bottom line is that organizations of the '90s need a software environment that allows their new and existing applications to share information and resources with each other, regardless of which systems the applications run on. Digital is answering this need with Network Application Support (NAS).

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Comprehensive Application Services Built on Open Standards

NAS is Digital's strategy for delivering the unified software environment for the '90s.

NAS comprises a comprehensive set of application services that allows software applications to integrate well with one another across a distributed environment of multi-vendor systems. These services are based on existing and emerging industry standards. Applications and solutions built using NAS services answer users' needs for accessing, communicating, and sharing information and resources across a network of different desktop devices and server systems.

NAS services encompass three categories:

- Applications Access Services -- which define the way users and applications access other applications;
- Communications Services -- which allow users and applications to communicate within an enterprise and between enterprises; and
- Information and Resource Sharing Services -- which allow users and applications to share network-wide information and network-wide resources.

Figure 1 presents NAS services, and their benefits, available today.

The foundation for NAS services is Digital's Application Integration Architecture (AIA), which defines architectural specifications and application programming interfaces (APIs) based on industry standards. NAS is based on these specifications and APIs, delivering the actual software -- toolkits, libraries, and products -- used to build applications that allow users to access, communicate, and share information in a multi-vendor environment.

A key goal of NAS is to implement and expand upon strategic industry software standards, and to provide open access to specifications. For example, the APIs upon which NAS services are based are in general a superset of the Open Software Foundation's APIs. Digital will work to have new APIs accepted by OSF as new NAS services are built on them; likewise, if other APIs are selected by OSF, Digital will work to include those APIs within NAS.

By building NAS services on industry standards, Digital can assure its customers of long-term growth, compatibility, and flexibility. Figure 2 lists the relevant standards upon which NAS services are based.

NAS services extend to users of a wide range of popular desktops, including:

- VT terminals (on VMS and ULTRIX operating systems);
- DECwindows terminals (on VMS and ULTRIX operating systems);
- IBM 3270 terminals (on VMS and ULTRIX operating systems);
- VMS and ULTRIX DECwindows workstations;
- MS-DOS and OS/2 personal computers; and
- Apple Macintosh systems.

Digital's VAX and RISC-based systems act as servers to provide NAS services to these networked desktops. The result: a cohesive enterprise network on which all systems work together (see Figure 3).

Implementing NAS

NAS services comprise well-defined toolkits, runtime libraries, and products, which are used by Digital and other application developers to craft new and innovative distributed applications -- applications that cooperate across different operating environments to provide a much higher level of integration than has ever been possible before.

NAS enables users to move beyond simple network connectivity, to transparently share network-wide applications, computing services, and information. And they can do so regardless of their desktop device of choice, without having to adapt to a new operating environment -- enhancing investments in hardware, software, training, and experience.

For instance, a user on an ULTRIX workstation can utilize a LiveLink connection to link live information from a remote VMS database on the network into a local document. A user on a VMS workstation can scan an image and mail it to the ULTRIX workstation user, who can then include the image in a document, along with graphics created by a Macintosh user or a spreadsheet created by a PC user.

NAS services allow applications to transparently share network-wide services and information as well. For example, applications can utilize a standard SQL interface to access corporate databases on IBM mainframes, and distributed relational databases on VMS and ULTRIX systems.

NAS gives customers the flexibility to deploy applications and information as their organization and people require, across a wide range of systems. They can take advantage of new technology without throwing out what they already have, or radically disrupting users or developers.

Customers can easily add powerful UNIX-based solutions to their computing environment -- there is no either/or choice. NAS provides common services across VMS and ULTRIX; for example, DECwindows allows users to easily access applications running on both VMS and ULTRIX systems. And CDA (Compound Document Architecture) allows data of all types -- including text, graphics, and images -- to be shared compatibly across VMS and ULTRIX systems.

Computing services such as these also simplify application development. Digital, for instance, was easily able to develop the DECwrite compound document editor for both VMS and ULTRIX systems simultaneously -- using NAS services.

What's Here Today

Digital has been delivering NAS services over the last 18 months. Digital introduced Phase I of NAS in January 1988 with Terminal Services, Messaging Services, and File Sharing Services. In January 1989, Phase II of NAS focused on the desktop, delivering Windowing Services, Compound Document Services, and Application Control Services. Phase III of NAS, in April 1989, launched Forms Services, Graphics Services, and Repository Services. And July 1989 has brought Phase IV, extending NAS with Data Access Services, Data Conversion Services, and Print Services.

These four phases of NAS represent the broadest set of application services available in the industry -- and these services are deliverable today.

Digital also offers a number of products today that are built on one or more NAS service. These products include DECwindows out-of-the-box applications, DECwrite, DECchart, DECdecision, DECimage software, VAX Notes, and VAX VTX. And NAS-based applications and services are delivered to office users with ALL-IN-1 Phase II, Digital's office computing strategy for the '90s.

In addition, hundreds of ISV applications are being developed that implement services such as DECwindows and CDA, or that are being built on the standards underlying NAS services -- standards such as the X Window System, FIMS, and SQL, for example.

NAS is rooted in Digital's heritage of system compatibility from desktop to data center; it is not a program made necessary by fundamental system incompatibilities. Nor does NAS focus narrowly on just one type of proprietary system; it instead supports a wide range of multi-vendor systems -- VMS, ULTRIX, MS-DOS, OS/2, and Macintosh. Based on existing and evolving industry standards, NAS adds value to customers' investments, and allows application developers to extend their applications -- not re-write them.

And most importantly, NAS services and applications are available today, enabling customers to begin now in implementing the unified software environment they need to compete effectively in the future.

NAS is a continuing effort that will afford graceful and consistent evolution into the '90s and beyond. Over the next year, Digital will announce new NAS services, new functionality, and broader support of existing services across multiple NAS platforms.

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Note to Editors:

ALL-IN-1, CDA, CDD/Plus, DECdecision, DEC/EDI, DECforms, DECimage, DECnet/OSI, DECprint, DECwindows, DECwrite, LiveLink, MAILbus, Network Application Support, VAX, VAX Notes, VAX VTX, VMS, VT, and ULTRIX are trademarks of Digital Equipment Corporation.

Macintosh is a trademark of Apple Computer, Inc.

MS-DOS is a trademark of Microsoft Corporation.

OSF/Motif is a trademark of the Open Software Foundation.

UNIX is a trademark of American Telephone and Telegraph.

X Window System is a trademark of the Massachusetts Institute of Technology.

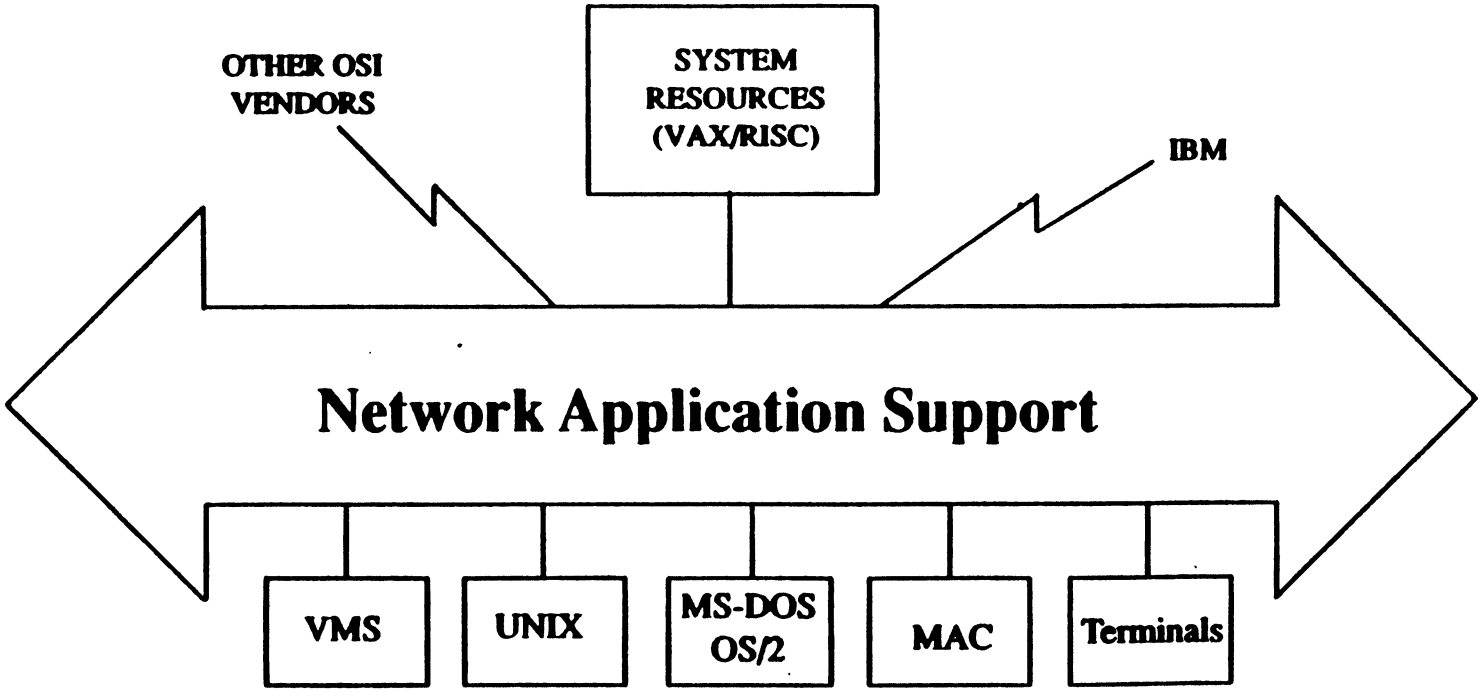
SERVICE	AVAILABLE TODAY	BENEFIT
Applications Access		
o Windowing Services	- DECwindows on VMS, ULTRIX, MS-DOS (display facility)	Easy to develop applications with a consistent window/icon/mouse user interface.
o Forms Services	- DECforms	Easy to develop applications that solicit and present information to/from users in a structured way; facilitates interaction with databases.
o Terminal Services	- VT emulation across all platforms	Enables users from different desktops to access character-mode applications on host.
o Graphics Services	- DEC GKS - DEC PHIGS	Easy to develop applications that consistently create, manipulate, and display two- and three-dimensional graphics.
o Application Control Services	- LiveLink - BUILDER	Enables an application to ask other applications to perform processing on its behalf or to dynamically share data.
Communications		
o Messaging Services	- MAILbus	Enables users and applications to create, edit, send, receive, forward, etc. messages across a network.
o EDI Services	- VAX/EDI (UK only)	Provides consistent electronic exchange of structured business documents between an enterprise and its vendors, customers, and other trading partners.
Information/Resource Sharing		
o Compound Document Services	- CDA Toolkit - CDA Viewers - CDA Converter Library - DECimage Applications Services	Easy to develop applications which need to exchange compound documents or share text, graphics, images, tables, and other data.
o Data Access Services	- SQL/Services	Provides a consistent way of making queries or generally manipulating data within a database or file system.
o Repository Services	- CDD/Plus	Provides a consistent way for applications and users to define data, and to access these definitions and the underlying data in a controlled manner.
o File Sharing Services	- VMS Services for MS-DOS - NFS for ULTRIX; - VMS/ULTRIX Connection - ALL-IN-1 File Cabinet	Provides easy storage, retrieval, and sharing of files in a distributed environment from a variety of desktops.
o Print Services	- DECprint across all platforms	Provides a simple way for applications and users to print from a variety of systems to a variety of output devices, without specifying exact formats or print characteristics.

Figure 1 – Network Application Support: Services Available Today and Benefits

SERVICE	RELEVANT STANDARDS
Applications Access	
o Windowing Services	- X Window System (endorsed by X/Open; ANSI X3H3.6 in process) - OSF/Motif (IEEE 1201 in process)
o Forms Services	- Form Interface Management System (ISO SC22/WG18)
o Terminal Services	- ANSI X3.64
o Graphics Services	- ISO 7942, ANSI X3.124, ANSI X3.144
o Application Control Services	- Emerging: Remote Procedure Call (NCS/RPC, OSF RFT, ECMA 127, ISO DIS 10148, ANSI X3T5); IEEE 1003.4, IEEE 1003.8
Communications	
o Messaging Services	- CCITT X.400
o EDI Services	- ANSI X12, EDIFACT
Information/Resource Sharing	
o Compound Document Services	- ODA/ODIF (ISO 8613) - SGML (ANSI X3.143, ISO 8879) - Abstract Syntax Notation (ASN.1 -- ANSI X3T2, ISO 8824-5)
o Data Access Services	- SQL (ISO, ANSI X3.135)
o Repository Services	- Emerging: Information Resource Dictionary Services (ANSI X3.138, ISO TC97)
o File Sharing Services	- Network File System (de facto; IEEE 1003.8 in process)
o Print Services	- ECMA/ISO Print Systems Interconnect - PostScript (de facto)

Figure 2 -- Network Application Support: Relevant Industry Standards

UNIFIED SOFTWARE ENVIRONMENT



Network Application Support enables developers to write and users to run applications that work together on the widest variety of servers, systems and desktops in the industry.

Figure 3 -- Network Application Support: Unified Software Environment